

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

- 1-19. (Canceled)
20. (Currently Amended) A method of preparing 3-(Z)-nonenal, 2-(E)-nonenal, or their corresponding alcohols from (9S,10E,12Z) 9-hydroperoxyoctadeca-10,12-dienoic acid, comprising
- (a) contacting the (9S,10E,12Z) 9-hydroperoxyoctadeca-10,12-dienoic acid with an isolated fatty acid hydroperoxide lyase having activity for both 9-hydroperoxide substrates and 13-hydroperoxide substrates, ~~wherein K_m and V_{max} of the lyase for 9-hydroperoxylinolenic acid are greater than K_m and V_{max} of the lyase for 9-hydroperoxylinoleic acid, and wherein the lyase has an amino acid sequence present in a protein isolated from *Cucumis melo* comprising the amino acid sequence SEQ ID NO:7, wherein the lyase has a 9-HPL function,~~ thereby converting the (9S,10E,12Z) 9-hydroperoxyoctadeca-10,12-dienoic acid into 3-(Z)-nonenal; and either
 - (b) recovering the 3-(Z)-nonenal;
 - (c) reducing the 3-(Z)-nonenal into 3-(Z)-nonenol and recovering the 3-(Z)-nonenol; or
 - (d) isomerizing the 3-(Z)-nonenal under temperature and pH conditions effective to obtain 2-(E)-nonenal and either recovering the formed 2-(E)-nonenal or reducing the 2-(E)-nonenal to 2-(E)-nonenol and recovering the 2-(E)-nonenol from the medium.
21. (Currently Amended) A method of preparing n-hexanal or its corresponding alcohol from (9Z,11E,13S) 13-hydroperoxyoctadeca-9,11-dienoic acid, comprising
- (a) contacting the (9Z,11E,13S) 13-hydroperoxyoctadeca-9,11-dienoic acid with an isolated fatty acid hydroperoxide lyase having activity for both 9-hydroperoxide substrates and 13-hydroperoxide substrates, ~~wherein K_m and V_{max} of the lyase for~~

~~9-hydroperoxylinolenic acid are greater than K_m and V_{max} of the lyase for 9-hydroperoxylinoleic acid, and wherein the lyase has an amino acid sequence present in a protein isolated from *Cucumis melo* comprising the amino acid sequence SEQ ID NO:7, wherein the lyase has a 9-HPL function, thereby converting the (9Z,11E,13S) 13-hydroperoxyoctadeca-9,11-dienoic acid into n-hexanal; and either~~

- (b) recovering the n-hexanal; or
 - (c) reducing the n-hexanal into n-hexanol and recovering the n-hexanol.
22. (Currently Amended) The method of claim ~~20~~ 44, wherein the V_{max} of the lyase for 9-hydroperoxide substrates is greater than the V_{max} for 13-hydroperoxide substrates.
23. (Currently Amended) The method of claim ~~20~~ 44, wherein the K_m of the lyase for 9-hydroperoxide substrates is greater than for 13-hydroperoxide substrates.
24. (Canceled)
25. (Previously Presented) The method of claim 20, wherein the lyase comprises the amino acids unique to *Cucumis melo* and set forth in SEQ ID NO:7 which provide the activity of cleaving 9-hydroperoxide substrates with greater activity than 13-hydroperoxide substrates.
26. (Currently Amended) The method of claim 20, wherein the lyase comprises an amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, and SEQ ID NO:6, ~~and SEQ ID NO:7.~~
27. (Currently Amended) The method of claim ~~24~~ 45, wherein the V_{max} of the lyase for 9-hydroperoxide substrates is greater than the V_{max} for 13-hydroperoxide substrates.
28. (Currently Amended) The method of claim ~~24~~ 45, wherein the K_m of the lyase for 9-hydroperoxide substrates is greater than for 13-hydroperoxide substrates.

29. (Canceled)
30. (Previously Presented) The method of claim 21, wherein the lyase comprises the amino acids unique to *Cucumis melo* and set forth in SEQ ID NO:7 which provide the activity of cleaving 9-hydroperoxide substrates with greater activity than 13-hydroperoxide substrates.
31. (Currently Amended) The method of claim 21, wherein the lyase comprises an amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, and SEQ ID NO:6, ~~and SEQ ID NO:7.~~
32. (Currently Amended) A method of preparing (3Z,6Z)-nonadienal, (2E,6Z)-nonadienal, or their corresponding alcohols from (9S,10E,12Z,15Z) 9-hydroperoxyoctadeca-10,12,15-trienoic acid, comprising
- (a) contacting the (9S,10E,12Z,15Z) 9-hydroperoxyoctadeca-10,12,15-trienoic acid with an isolated fatty acid hydroperoxide lyase having activity for both 9-hydroperoxide substrates and 13-hydroperoxide substrates, ~~wherein K_m and V_{max} of the lyase for 9-hydroperoxylinolenic acid are greater than K_m and V_{max} of the lyase for 9-hydroperoxylinoleic acid, and wherein the lyase has an amino acid sequence present in a protein isolated from *Cucumis melo* comprising the amino acid sequence SEQ ID NO:7, wherein the lyase has a 9-HPL function,~~ thereby converting the (9S,10E,12Z,15Z) 9-hydroperoxyoctadeca-10,12,15-trienoic acid into (3Z,6Z)-nonadienal; and either
 - (b) recovering the (3Z,6Z)-nonadienal;
 - (c) reducing the (3Z,6Z)-nonadienal into (3Z,6Z)-nonadienol and recovering the (3Z,6Z)-nonadienol; or
 - (d) isomerizing the (3Z,6Z)-nonadienal under temperature and pH conditions effective to obtain (2E,6Z)-nonadienal and either recovering the formed (2E,6Z)-nonadienal or reducing the (2E,6Z)-nonadienal to (2E,6Z)-nonadienol and recovering the (2E,6Z)-nonadienol from the medium.

33. (Currently Amended) A method of preparing 3-(Z)-hexen-1-al, 2-(E)-hexen-1-al, or their corresponding alcohols from (9Z,11E,13S,15Z) 13-hydroperoxyoctadeca-9,11,15-trienoic acid, comprising
- (a) contacting the (9Z,11E,13S,15Z) 13-hydroperoxyoctadeca-9,11,15-trienoic acid with an isolated fatty acid hydroperoxide lyase having activity for both 9-hydroperoxide substrates and 13-hydroperoxide substrates, ~~wherein K_m and V_{max} of the lyase for 9-hydroperoxylinolenic acid are greater than K_m and V_{max} of the lyase for 9-hydroperoxylinoleic acid, and wherein the lyase has an amino acid sequence present in a protein isolated from *Cucumis melo* comprising the amino acid sequence SEQ ID NO:7, wherein the lyase has a 9-HPL function,~~ thereby converting the (9Z,11E,13S,15Z) 13-hydroperoxyoctadeca-9,11,15-trienoic acid into 3-(Z)-hexen-1-al; and either
 - (b) recovering the 3-(Z)-hexen-1-al;
 - (c) reducing the 3-(Z)-hexen-1-al into 3-(Z)-hexen-1-ol and recovering the 3-(Z)-hexen-1-ol; or
 - (d) isomerizing the 3-(Z)-hexen-1-al under temperature and pH conditions effective to obtain 2-(E)-hexen-1-al and either recovering the formed 2-(E)-hexen-1-al or reducing the 2-(E)-hexen-1-al to 2-(E)-hexen-1-ol and recovering the 2-(E)-hexen-1-ol from the medium.
34. (Currently Amended) The method of claim ~~32~~ 46, wherein the V_{max} of the lyase for 9-hydroperoxide substrates is greater than the V_{max} for 13-hydroperoxide substrates.
35. (Currently Amended) The method of claim ~~32~~ 46, wherein the K_m of the lyase for 9-hydroperoxide substrates is greater than for 13-hydroperoxide substrates.
36. (Canceled)
37. (Previously Presented) The method of claim 32, wherein the lyase comprises the amino acids unique to *Cucumis melo* and set forth in SEQ ID NO:7 which provide the activity of

cleaving 9-hydroperoxide substrates with greater activity than 13-hydroperoxide substrates.

38. (Currently Amended) The method of claim 32, wherein the lyase comprises an amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, and SEQ ID NO:6, ~~and SEQ ID NO:7~~.
39. (Currently Amended) The method of claim ~~33~~ 47, wherein the V_{\max} of the lyase for 9-hydroperoxide substrates is greater than the V_{\max} for 13-hydroperoxide substrates.
40. (Currently Amended) The method of claim ~~33~~ 47, wherein the K_m of the lyase for 9-hydroperoxide substrates is greater than for 13-hydroperoxide substrates.
41. (Canceled)
42. (Previously Presented) The method of claim 33, wherein the lyase comprises the amino acids unique to *Cucumis melo* and set forth in SEQ ID NO:7 which provide the activity of cleaving 9-hydroperoxide substrates with greater activity than 13-hydroperoxide substrates.
43. (Currently Amended) The method of claim 33, wherein the lyase comprises an amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, and SEQ ID NO:6, ~~and SEQ ID NO:7~~.
44. (New) The method of claim 20, wherein the lyase has activity for both 9-hydroperoxide substrates and 13-hydroperoxide substrates, wherein K_m and V_{\max} of the lyase for 9-hydroperoxylinolenic acid are greater than K_m and V_{\max} of the lyase for 9-hydroperoxylinoleic acid.
45. (New) The method of claim 21, wherein the lyase has activity for both 9-hydroperoxide substrates and 13-hydroperoxide substrates, wherein K_m and V_{\max} of the lyase for 9-

hydroperoxylinolenic acid are greater than K_m and V_{max} of the lyase for 9-hydroperoxylinoleic acid.

46. (New) The method of claim 32, wherein the lyase has activity for both 9-hydroperoxide substrates and 13-hydroperoxide substrates, wherein K_m and V_{max} of the lyase for 9-hydroperoxylinolenic acid are greater than K_m and V_{max} of the lyase for 9-hydroperoxylinoleic acid.
47. (New) The method of claim 33, wherein the lyase has activity for both 9-hydroperoxide substrates and 13-hydroperoxide substrates, wherein K_m and V_{max} of the lyase for 9-hydroperoxylinolenic acid are greater than K_m and V_{max} of the lyase for 9-hydroperoxylinoleic acid.